

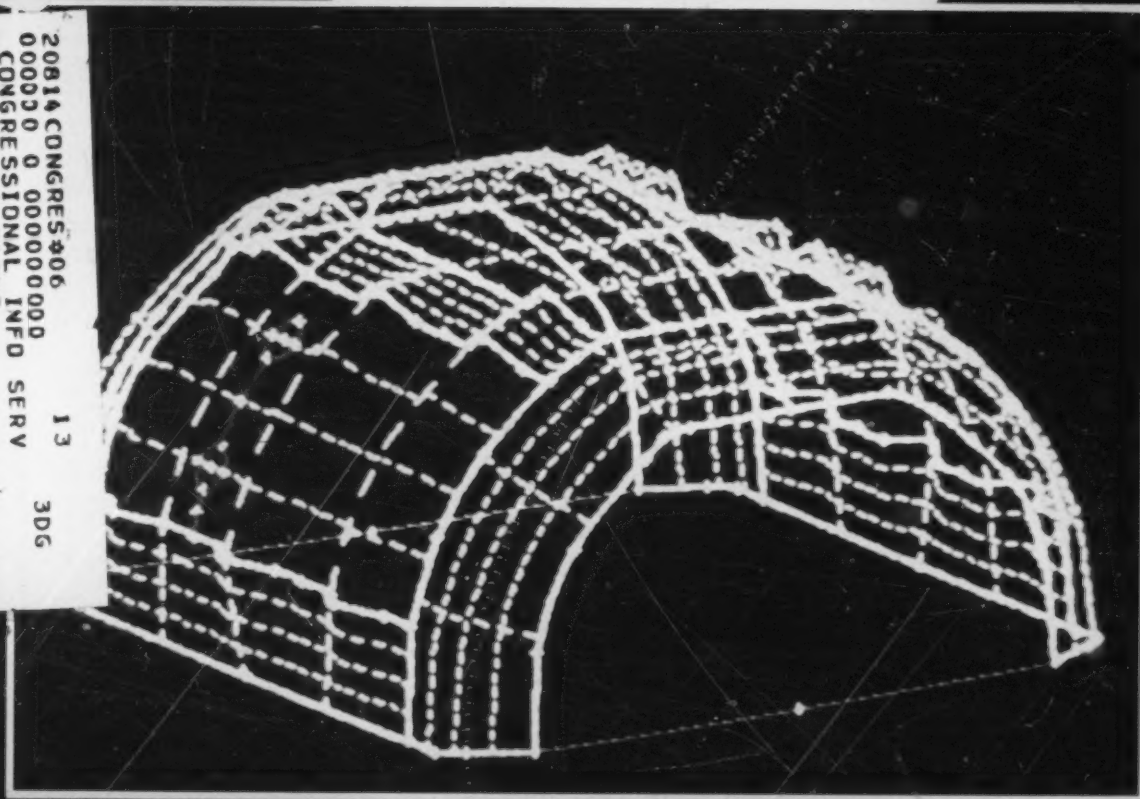
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TURNKEY SYSTEM OR IN-HOUSE?

ELECTION '82 AND WHAT IT MEANS TO BUSINESS
CONSUMER BUYING — METALWORKING'S REAL ECONOMIC INDICATOR
HOW 'HIPPIING' GIVES CASTINGS A FORGING QUALITY

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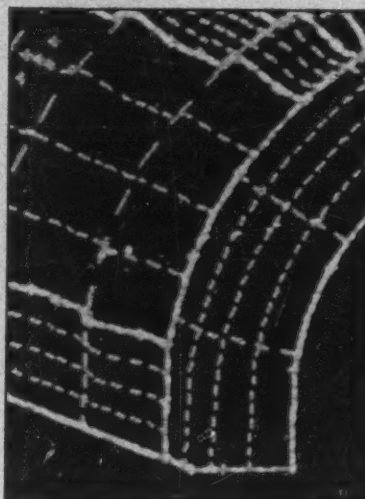
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Now it's survival of the fittest—suppliers cut their lifeline with Detroit.

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BUSINESS FINANCEFRONT

Divestitures are now beginning to dominate merger scene

The merger pace weakened in the third quarter, down 8 pct from the same period in 1981. The big dollar mergers, so popular in recent years, have subsided considerably. And the number of divestitures continues to climb.

That's the way W. T. Grimm & Co., the Chicago-based merger consultant, sums up third quarter and nine months merger activity so far in 1982.

In the third quarter of this year, net merger and acquisition announcements numbered 574. In third quarter 1981, they were 623.

Through the first nine months of this year, they were down 2 pct to 1,772 transactions from the year-earlier total of 1,807.

For the first three quarters, says Grimm, completed or pending transactions with a purchase price of \$100 million or more totaled 88, a decline from the 94 registered in the similar 1981 period.

Willard T. Grimm, the company's chairman, noted the 1982 nine-month tally represented the first decrease in "big deals" since 1975. Billion-dollar deals dropped from eight transactions to six.

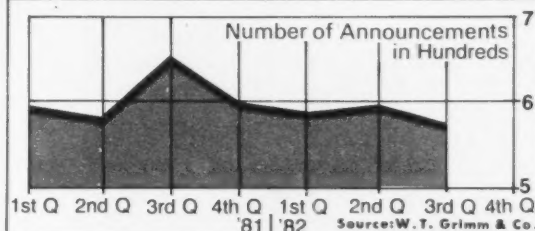
And due to the decline in "big deals," the total dollar value paid for all transactions (where a purchase price was given) went down to \$42.3 billion in the first nine months of 1982. Third quarter last year was a record breaking \$60.8 billion.

The biggest merger involving metalworking in the first nine months this year was Allied Corp.'s pending takeover of Bendix Corp.

But while the sizable dollar value deals are going down, the rate of sizable divestitures continues to climb.

Divestitures with price tags of \$100 million or more have grown from seven in the first three quarters of 1978 to a present nine-month aggregate of 27.

Merger Activity



Says Mr. Grimm, "With an emphasis on streamlining operations and strengthening balance sheets, corporate managements are divesting certain units so that they can concentrate their resources on the most productive areas and/or raise cash for debt reduction."

"Many corporations have earmarked both unprofitable divisions and profitable subsidiaries for divestment. A number of these transactions have taken the form of leveraged buy-outs in which management of the operating divisions become dominant equity participants with the assistance of professional merger consultants."

He notes that overall divestiture activity accounted for 654 or 37 pct of all transactions for the first nine months of 1982.

That is below the 620 or 34 pct in the comparable year-earlier period.

Ms. Tomislava Simic, Grimm's director of research, says the strength of the U.S. dollar has curbed the influx of foreign acquirers and at the same time may have acted as an added incentive for American purchases of foreign companies.

Top executives get raises, but bring home less money

Base pay for top executives of medium-sized firms increased in 1981. But, according to a recent survey, overall compensation actually declined.

The Peat, Marwick, Mitchell & Co. survey showed that salary plus bonus for the top officers increased at the rate of inflation, but total pay decreased by 9.5 pct because of losses in company stocks.

Division President: Levels of Pay

	Salary Plus Bonus		Capital Accumulation*	
	1981 Pay	Change 1980-81	1981	Change 1980-81
Steel	\$105,000	\$12,000	\$22,000	\$22,000
Metal Products	112,000	(12,000)	(17,000)	(54,000)
Machinery	107,000	3,000	28,000	22,000
Computers	125,000	6,000	(17,000)	(36,000)
Diversified Mfrs.	131,000	(5,000)	28,000	26,000

*Value at fiscal year end. Note: Figures in parentheses indicate a loss. Source: Peat, Marwick, Mitchell & Co.

The international accounting firm reports that long-term compensation, or capital accumulation, declined 70 pct reflecting the slow-moving stock market. Modest increases in base salary and cash incentives were more than offset by the decline in shares and options held by executives.

The survey notes that executives in medium-sized oil companies fared the worst, while top officers in steel and machinery companies increased their base income and their capital accumulation last year. The entire sample included 251 companies in 12 industries in the *Fortune* Second 500 list of companies.

The report notes that pay for executives increasingly is being tied to performance. "A decade marked by a weak economy and increasing international competition has changed the orientation of personnel policies from paternalism to productivity," says Peter Chingos, executive compensation partner.

More than two-thirds of the companies surveyed said they use some type of annual bonus plan. Most are based on either pre-determined goals and targets, or formulas. Mr. Chingos suggests that "companies are paying for the achievement of three-to-five year business objectives as well as for the achievement of their annual budgets."

METALWORKING ORDER TRENDS

The orders light stays on red—no shift yet to yellow

Lackluster

That's the label for metalworking new orders in September.

And that has been the label on orders since way back in July of 1981. Since that month, new orders for durable goods fell by 17 pct. Remove the inflation factor, and the 14-month decline comes out to about 25 pct.

There are still no signs of an end to the slide, let alone a turnaround. It seems the best that can be hoped for is a few months of a plateau in orders. That could indicate a springboard was being built that might finally catapult orders upward on a recovery spiral.

As one machine tool industry executive put it recently, "A turn-up in orders? Heck, I'm just looking for a floor."

Durable goods new orders in September declined by 0.1 pct, or \$0.1 billion from August. This was the fifth decline over the past six months. Metalworking industry products account for almost 90 pct of total durable orders.

The drag on orders in September was centered in the transportation equipment and primary metals industries. Transportation equipment was down \$1.7 billion, or 10.3 pct, to \$14.4 billion. Aircraft and aircraft parts and motor vehicles and auto parts led the decline.

And it was continued softness in the steel industry that put primary metals orders on the skids in September. The orders dollar volume decline in steel was 9.6 pct.

If there was any slim ray of hope or promise in the September orders data, it came from a slight gain in orders for machinery, both nonelectrical and electrical. Orders for nonelectrical machinery rose by 6.6 pct, or \$0.8 billion; orders for electrical machinery rose by 4.4 pct, or \$0.5 billion. These orders in recent months have gone up on a monthly basis only to tumble in subsequent months.

Another spot where some future turnaround strength might be seen was actually in an orders dip. In September, orders for defense industry capital goods fell by \$1.1 billion, or 20 pct, to \$4.2 billion.

In view of upcoming Pentagon releases of big-dollar contracts, new orders should start flowing to producers of capital war goods. That would be a sharp turn-up from current low levels.

Despite some promising signs in September, inventories, that leading indicator of orders, fell for the third straight month.

Billions of dollars, seasonally adjusted
monthly total, unless otherwise noted

Latest Month or Qtr. Previous Month or Qtr. Same Period Year Ago

Capital Expenditures (Annual Rates)

U.S. Industry, Total.....	4th Qtr.	\$324.5*	\$320.2	\$327.8
Manufacturing, Total	4th Qtr.	122.9*	123.1	126.9
Manufacturing, Durable Goods.....	4th Qtr.	58.8*	60.0	60.8
Mining Industry	4th Qtr.	16.2*	15.7	16.8

Key Indicators, Durable Goods Manufacturing

New Orders.....	Sept.	72.9	73.0	84.5
Shipments	Sept.	76.2	77.2	84.7
Inventories	Sept.	182.8	183.6	187.7
Unfilled Orders.....	Sept.	286.7	290.0	316.8

New Orders, Metalworking

Capital Goods Producers,

Nondefense Industries	Sept.	19.8	18.9	24.3
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Capital Goods Producers,

Defense Industries	Sept.	4.2	5.3	5.9
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Primary Metals, Total	Sept.	7.9	8.2	11.1
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Steel (SIC 331).....	Sept.	3.4	3.7	5.7
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Iron & Steel Castings (SIC 332).....	Sept.	.6	.7	1.0
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Nonferrous Metals	Sept.	3.9	3.8	4.4
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Nonelectrical Mach.-Equip.

Industrial, Total	Sept.	13.9	13.1	17.6
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Engines & Turbines	Sept.	.9	1.1	1.5
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Farm Machinery & Equipment				
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(Shipments).....	Sept.	1.0	.8	1.5
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Construction, Mining &				
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Materials Hdlg. Equip.	Sept.	2.6	2.2	3.2
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General Industrial Machinery	Sept.	1.2	1.0	1.4
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Fluid Power Equipment**				
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(Index-1972=100).....	Sept.	163	163	293
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Metalworking Machinery	Sept.	.6	.7	.8
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Machine Tools, Total				
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(Millions \$, unadjusted)***	Sept.	86.8	86.5	187.3
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Machine Tools, Metal-Cutting***	Sept.	52.4	60.4	151.0
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Machine Tools, Metal-Forming***	Sept.	34.4	26.1	36.3
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Electrical Mach. & Equip.

Industries, Total	Sept.	12.1	11.6	12.5
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Elec. Transmission Equip.				
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& Industrial Apparatus.....	Sept.	1.6	1.5	1.9
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Household Appliances.....	Sept.	1.1	1.1	1.1
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Communication Equipment	Sept.	4.3	4.3	4.2
-------------------------------	-------	-----	-----	-----

Transportation Equip.

Industrial, Total	Sept.	14.4	16.1	17.2
-------------------------	-------	------	------	------

Motor Vehicles & Parts (Shipments)	Sept.	9.5	11.0	9.9
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Aircraft, Missiles & Parts	Sept.	3.8	5.2	6.2
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Shipbuilding & Military Tanks	Sept.	0.4	0.1	.6
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Fabricated Metal Products, Total.....	Sept.	8.8	8.9	10.0
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Instruments, Total.....	Sept.	4.1	3.9	4.0
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*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.

WILL TURNKEY CAD/CAM SYSTEMS REMAIN VIABLE?

As CAD/CAM users more clearly define their goals for integration, what types of systems will they find to satisfy these new demands?

By Alice M. Greene

CAD/CAM (computer aided design and computer aided manufacturing) has emerged in the past decade from a curiosity to one of the key technologies in the re-industrialization of the United States. With a growth rate averaging 35 pct per year or perhaps

better, the market for the computer graphics industry is projected to reach \$10 billion by 1987.

Over the past ten years, the nature of the systems offered has changed to satisfy the changing needs of users. The scope of systems available today gives a customer a wide choice in terms of both systems size and support. It may, in fact, confuse the customer a little, as

similar claims are made by proponents of very different systems.

The mainstay of early CAD/CAM business was the turnkey system. Turnkey vendors sold hardware, software, support, training, service. These vendors gave the business public the chance to see the gains in productivity and profitability that could be accomplished by using modern computer graphics technology.

Most of the early systems used com-

(Cont. on p. 52)

Turnkey vendors like Calma are expanding their functionality at both the high and low ends of their product line.



Estimated CAD/CAM Market Shares

	1979	%	1980	%	1981	%	1982 Est.	%
Computervision	\$103	31	\$191	34	\$276	34	\$355	33
IBM	40	12	71	13	130	16	180	17
Applicon	43	13	68	12	96	12	125	12
Calma	48	14	62	11	90	11	117	11
Intergraph	30	9	56	10	84	10	122	11
Auto-trol Technology	33	10	51	9	33	5	33	3
Gerber	12	4	14	2	17	2	19	2
McAuto (McDonnell Doug.)	4	1	7	1	12	1	16	2
Other	21	6	45	8	77	9	93	9
	\$334	100%	\$565	100%	\$815	100%	\$1060	100%

Source: Merrill Lynch, CAD/CAM Review, 1981

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Sperry Univac offers the convenience of one vendor for all information processing needs. CAD/CAM meshes easily with manufacturing management programs.

(Cont. from p. 40)

puter systems which best answered their needs at that time. They used 16-bit computers—good computers which handled design problems, could tackle numerical control, in short, they were state of the art for this type of application.

Naturally enough, some of the turnkey vendors gained more experience in some applications than others, and vendors developed a "personality." Some were mechanical, some were electronic, etc.

Productivity gains reported by early users were valid. Improvements of 3:1 or 4:1 in design time were commonplace.

At the same time as these turnkey systems were developing, several large user organizations, airframe manufacturers and automotive companies were developing their own CAD/CAM systems privately. Their needs were unique in terms of complexity and precision required. The systems developed were developed on the computer systems which suited these organizations. They used large mainframe computers for the most part.

Things have changed a bit.

Almost the entire industrial community has become aware of the advantages of integrating manufacturing sys-

tems within a facility. This encompasses integrating design and manufacturing, business planning and production planning, product design and capacity planning.

No area can exist as a separate entity today as efficiently as it could if its operation, goals, material needs, personnel availability were integrated, were considered as inter-related factors adding up to a whole business operation. Business and technology; engineering and design; management and factory floor—all contribute to a business enterprise; all have information systems which can contribute more to the whole if they communicate.

This trend has changed the CAD/CAM industry. Users who gained experience with earlier turnkey systems, see this technology as a vehicle for integrating their operations, and these users want more capability from the systems they have. The turnkey vendors have responded to these demands by increasing the scope and the horsepower of their systems.

Users who licensed the software developed by the large airframe companies have grown in number. Their path to integration is facilitated by the data base management capabilities of the large mainframe computer systems in which the software resides.

At this point, although potential customers can achieve success either by investing in an enhanced turnkey CAD/CAM system or by acquiring CAD/CAM software to run on their mainframe computer, the ultimate 'best choice' is not fixed. Maybe it depends

on the size of the company, maybe on that company's goals.

There are many opinions, but the spectrum of choice is too broad for generalization. The facts seem to say that the application of CAD/CAM, at whatever level a company is capable, will bring results—the extent of those results depends on the wisdom of the company, and its wisdom in applying computer aided technology as well as in its choice of CAD/CAM system.

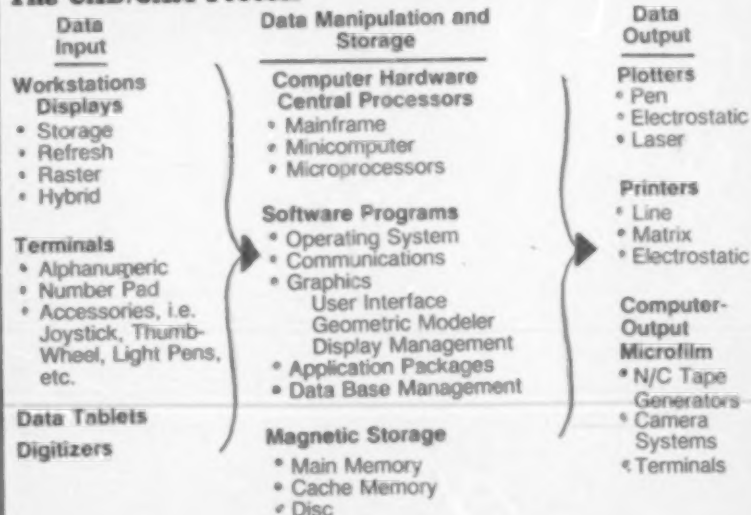
There exist at the present time, three major groupings of CAD/CAM systems. The first is the low-cost stand-alone system. These systems range in price at or below \$100,000. These systems are ideal for some users who will never need anything much bigger—architects, the education sector, some printed circuit board design and small mechanical design applications.

Then, there are systems with multiple stations that operate together. These cluster-type systems cost in the range of \$400,000 for four stations and suit the needs of a medium size company with fairly complex design problems.

The third group of CAD/CAM systems or trends in the CAD/CAM industry is for large, complex systems which are capable of handling the design and manufacturing needs of a user and of integrating these activities with other information processing systems the user has or plans.

This integration can be accomplished through the newer turnkey systems which network multiple CPUs (central processing units) together to provide a more powerful computing re-

The CAD/CAM Process



Source: Auto-trol

METALWORKING'S MANUFACTURING SYSTEMS

source and which also provide the ability to interface with any corporate computer environment.

Integration can also be accomplished by starting at the corporate computer, adding CAD/CAM software and graphics capability and building an in-house system. A number of mainframe computer manufacturers offer this approach with software either developed by that company or acquired.

IBM is, of course the most notable of the mainframe companies. Its market share in CAD/CAM has increased dramatically in the past few years.

IBM offers CADAM (Computer-Graphics Augmented Design and Manufacturing) a software package developed and used by The Lockheed Corp. over the past decade. CADAM is a two-dimensional system primarily for mechanical design.

IBM also provides three-dimensional capability through a software system developed by Dassault Systemes of Paris, called CATIA (Computer-Graphics Aided Three-Dimensional Interactive Application).

Most of all, IBM offers IBM with its image for support and service and its reputation for managing huge corporate data needs.

A proponent of the large computer resource for the successful application of CAD/CAM is Richard N. Spann, president of Adage, Inc. Adage manufactures high-quality computer graphics terminals and systems.

"I see a trend toward component selection between now and 1990," says Dr. Spann. "The graphics business is going to turn into a commodity business. Users are going to be able to buy software and hardware and buy it independently."

"We are going to see users buying constituent components of graphics as they enter their second generation of utilization, as they start pushing further toward the manufacturing end of CAD/CAM," he adds.

The gap between design and manufacturing has not been bridged yet, believes Dr. Spann. And it is unlikely that any one vendor can get its hands around a company's internal processes, design constraints, manufacturing techniques, documentation philosophies.

"Somehow that company is going to have to pick and choose components that come closest to meeting its requirements—software components and a hardware home for the software. Nobody is going to have good CAD/CAM unless they have well thought-out data base understanding. To manufacture a

part you have to have more than a description of the part, you have to have a description of the manufacturing process.

"Complete CAD/CAM is going to require lots of rethinking in data bases. And corporate-wide data bases don't live in little machines, they need big mainframes," Dr. Spann adds.

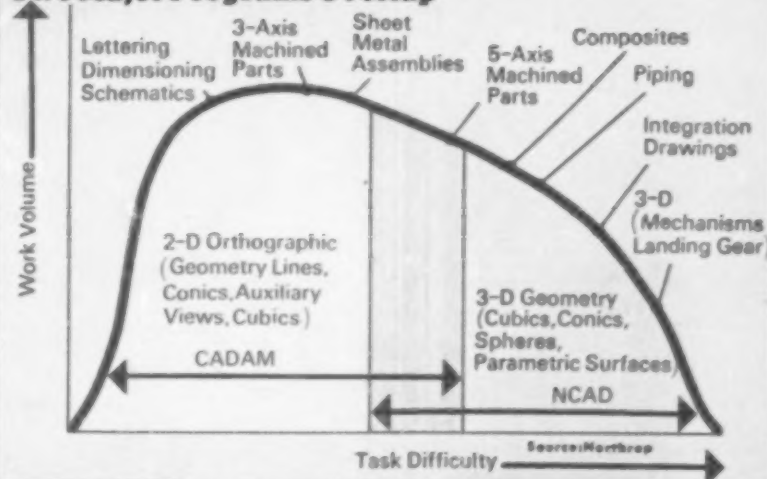
On the other side of the coin, are the turnkey vendors who feel that their approach is the best way for a company to reap the benefits of CAD/CAM and that the concepts being incorporated in the newer turnkey systems will help a

the way to supporting industry-neutral data base exchange standards.

In terms of managing a user company's corporate data base, Mr. Peterson says that there are some functions of data management that large mainframes are excellent at handling. For on-line archiving, it's hard to beat IBM machines. They support massive numbers of discs, huge mass storage systems, and automated tape libraries.

The emphasis in one of CV's current product developments is a software package that will exploit IBM's capability. "If a user has more data than he

Two Major Programs Overlap



user company in his integration of CAD and CAM.

"Building your own CAD/CAM system will always result in more money being spent over the life cycle of the investment and hardly ever result in a better CAD/CAM product," says Matthew Peterson, manager of Software Technology Products, Strategic Marketing Group, Computervision.

One of the important challenges for turnkey vendors is to interact with the user company's corporate information environment. "Every customer that we see has already automated some part of his process of bringing a product to the marketplace somewhere in his corporation on some other computer. Turnkey CAD/CAM systems have to be sensitive to that and have ways of communicating and exchanging data with those other systems," adds Mr. Peterson.

Computervision feels it is the responsibility of the turnkey vendor to make it easy for users to imbed CAD/CAM systems into some larger corporate information scheme. That includes providing hardware links, communications protocols to talk to other computers, all

can store in his Computervision system, data that he wants on-line, but not necessary local, this package will allow that user to store the data on-line in the IBM system. Yet the data can be retrieved by the CV system. That's one example of turnkey systems making use of other computing resources," notes Mr. Peterson.

"On the other hand, the management of graphics data bases is something extremely specialized, which the larger computers are ill-suited to," he says.

Using the different systems to do what they do best gives the user the best solution. And having the turnkey vendor supply this solution saves time and money for the user.

One of the interesting aspects of this dynamic industry is that all of the suppliers, hardware suppliers, software suppliers, systems suppliers all see the same trends and have the same goal—for the high end of their market—CAD/CAM systems of varying complexities, distributed throughout a user organization, linked together and linked in some fashion to larger corporate systems for more thorough integration. Each sees

(Cont. on p. 34)

METALWORKING'S MANUFACTURING SYSTEMS

(Cont. from p. 53)

the same goal, but the approaches differ.

Sperry Univac, for example, has taken a third approach. The company does not provide a turnkey solution to CAD/CAM. Yet it has developed its own CAD/CAM software. It system runs on the company's 1100 series mainframe computers linked to its V77 minicomputers in a distributed processing configuration.

The strength of this approach, according to Jack Murphy, director, Manufacturing Industry Center, for Sperry Univac, is the integration of the various subsystems, design, drafting, numerical control, engineering analysis. Subsystems may run on the mainframe, as does analysis, or on the mini, as does design. The graphics terminals which are either from Adage or Megatek further distribute the processing power of the system.

Downloading a lot of the CAD/CAM operations to the minicomputer frees the mainframe to run other business programs, not the least of which is UNIS (Univac Industrial System), a modular solution to manufacturing control including MRP, Bill of Materials, etc.

"The UNIS*CAD system also allows integration with business systems such as the UNIS programs and with shop floor management systems as well. Once you have captured the geometry of a part, you can tie it into the manufacturing control system directly," says Mr. Murphy.

With its unique approach, Univac competes with both the turnkey systems and its brother mainframe computer companies. It gives a user one source for most of his information needs, technical and business. And since all the software used was designed to work together, interfacing between systems is smoother and simpler.

Perhaps in the process of seeking integrated solutions, all vendors, mainframe and turnkey are redefining their roles. Some of the support vendors like Sperry Univac are providing are almost as all-encompassing as turnkey. And, turnkey vendors are changing at the same time. Turnkey can be a networked system today, which goes beyond the scope of the original definition.

Turnkey vendors are adding hardware and software to satisfy their customers. Computervision has added a 32-bit computer for analysis to its network scheme. It has developed links to coordinate measuring machines and robots which have been displayed at the International Machine Tool Show.

Calma will shortly introduce a new system addressing the networking/distributed processing approach to CAD/CAM, according to Leif Rosqvist, vice president, Marketing for Calma.

Calma introduced a new low-cost system at the International Machine Tool Show. With the forthcoming announcement, the company will reassert its intention to remain a market leader.

Mr. Rosqvist feels the real strength of the turnkey companies is that they have the dedicated knowledge of CAD/CAM and that they are in the business of supplying systems, not computers.

"The value of the turnkey business," says E. Joseph Zemke, executive vice president, Auto-trol Technology Corp. is that it takes a fairly defined set of problems, like computer-aided design, manufacturing and engineering, and it provides a solution to those problems in terms of hardware, software, education and training and expertise. The solution, usually provides the user company with a pretty good return on the investment. The approach suited the early CAD industry, because it was a new business and people didn't understand it very well. What that led to was very highly specialized hardware and software.

Metalworking's Manufacturing System: 34



Other articles in this series in 1981:

Are PC Systems The Answer to Factory Automation, Oct. 26, pp. 44-48

Software: Making It Less Costly and More Available, Nov. 23, pp. 76-90

CAD/CAM Systems Explode in Metalworking, Dec. 28, pp. 48-51

In 1982:

Training the Next Generation of Manufacturers, Jan. 22, pp. 62-65

Data Communications: Vital Link in a Manufacturing System, Feb. 19, pp. 75-79

Robots Extend a Helping Hand, March 19, pp. 59-83

PCs Provide Shop Floor Control With Boardroom Impact, April 23, pp. 94-96

Speech Technology: The Voice of Tomorrow's Factories? May 21, pp. 92-97

The Emerging Worldwide NC Race, June 25, pp. 59-64

Are Superminis Challenging The Mainframe Computers, July 23, pp. 57-65

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Is It Time for a New Approach to NC Programming?, Sept. 24, pp. 83-89

Are Factory Systems the Path to Productivity?, Oct. 22, pp. 41-48

ware. It was very difficult to tie these systems into the rest of a business and most people didn't try," explains Mr. Zemke.

Now, as we have mentioned, computer aided design and manufacturing has been accepted and users want more from those systems, both in terms of that system's CAD/CAM solution and in terms of communicating to other computers in other plant areas.

Not only that, but sophisticated users no longer want to dedicate a special-purpose hardware resource to that function, says Mr. Zemke. Users may want electronic mail, word processing, other types of programs. And they want to use the same hardware to deliver those programs.

"In other words, don't give us a tool that only does CAD/CAM," he says. Auto-trol is responding to this shift in demand, by changing its philosophy to "opening up its system" to provide a CAD/CAM solution that will co-exist with other kinds of problem-solving tools.

"The graphics systems we ship today run on absolutely standard hardware and software. When a customer buys our VAX-based system, for example, he knows that any other program that runs on a VAX will run and co-exist with ours. He can share that resource in a much more comprehensive way," notes the Auto-trol executive.

"We also provide windows in and out of our CAD/CAM system, so that a customer programmer can, using a high level language, has access to all the facilities of the graphics system. He can extend the usage of it, and tie it into other parts of his business.

"A third aspect of change that we address is that, as you start to provide a computer at every workstation, such as Auto-trol's new line, you can dedicate that workstation to CAD/CAM. Or you can carry over the same philosophy we have used in the centralized system. Now the workstation can also have a broader role and can begin to satisfy a need for a more general purpose engineering/design workstation that goes beyond just graphics," he concludes.

This approach fulfills the traditional need of the turnkey system for a solution to a problem, and at the same time frees the computer resource to fill an additional role in the company information environment. □

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MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons
(000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	141	116	159	234
Buffalo	30	30	29	57
Pittsburgh	115	137	134	315
Youngstown	50	67	72	127
Cleveland	83	95	99	159
Detroit	96	103	95	141
Chicago	337	333	341	513
Cincinnati	69	64	68	96
St. Louis	52	55	54	87
Southern	68	61	73	213
Western	48	50	59	128
U.S. Production	1,089	1,111	1,183	2,070

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural).....	gross-ton 80.50-86.9*
Old range, non-bessemer	gross-ton \$32.78
Mesabi, regular-unscreened	gross-ton \$32.53
Mesabi, non-bessemer.....	gross-ton \$32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.

**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective November 1, 1982)

	Last Week	Two Weeks Ago	To Date 1982	To Date 1981
U.S. Steel Production				
Net tons, in thousands	1,089	1,111	63,262	103,407
Capability Utilization Rate	36.8	37.6	49.5	80.7
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (\$/lb.—eff. 4/4/82)	25.297	25.297	25.297	25.195
Pig Iron** (Net ton = 2000 lbs.)	\$213.00	\$213.00	\$213.00	\$203.00
Scrap No. 1 hvy.* ** (Gross ton = 2240 lbs.)	\$ 51.50	\$ 52.17	\$ 53.50	\$ 80.17
No. 2 bundles	\$ 38.83	\$ 39.17	\$ 39.50	\$ 56.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh ..	\$ 52.50	\$ 54.50	\$ 55.50	\$90.50
No. 1 steel, Philadelphia	55.50	55.50	58.50	68.50
No. 1 steel, Chicago.....	46.50	46.50	46.50	81.50
No. 1 bundles, Detroit...	41.50	44.50	47.50	83.50
Low Phos., Youngstown	52.50	56.50	58.50	95.50
No. 1 mach'y cast., Pgh	64.50	64.50	66.50	93.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	114.50
No. 1 mach'y cast., Chi.	103.50	103.50	103.50	120.50

*Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

** Pig Iron Composite

Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

*** Steel Scrap Composite

Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective November 1, 1982)

Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00	76.00-80.00	1/4/82
Copper (C)	72.00	71.00-72.00	10/19/82
Lead	23.00-26.00	23.00-29.00	10/22/82
Magnesium			
Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium			
Sponge	555.00-585.00	555.00	4/29/82
Zinc	40.00-42.00	41.00-42.00	10/5/82

ALUMINUM: 99.5%, COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: electro. Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas \$2.00
 Beryllium-aluminum 5% Be, per lb. contained Be \$201.00
 Beryllium-copper, per lb. cont. Be \$121.00
 Beryllium 97% powder 200 \$166.00
 Bismuth, ton lots \$1.35-\$1.45
 Cadmium, under one ton \$1.05-\$1.15
 Calcium, ton lots, crown \$3.05
 Chromium, 99.8% \$3.75
 Cobalt, 99%, cathode \$12.50
 Gold per troy oz. \$427.25
 Indium, dollars per troy oz. \$2.85-\$4.00
 Iridium, dollars per troy oz. \$560
 Magnesium sticks, 10,000 lbs. \$1.91
 Mercury, per 76-lb. f.o.b. N.Y. \$365-\$385
 Molybdenum, lb. tech. moly oxides, 20 lb. MO can \$6.85-\$8.50

Nickel oxide sinter at U.S. points of

entry	\$3.12
Palladium, per troy oz.	\$140
Platinum, per troy oz.	\$475
Rhodium, per troy oz.	\$600.00
Silver ingots, per troy oz.	\$10.27
Vanadium	\$4.94
Zirconium sponge.....	\$12.00-\$17.00

(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb. EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Oct. 25—558.15	Oct. 28—561.99
Oct. 26—558.41	Oct. 29—521.85
Oct. 27—559.07	

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turnings
Copper	67½	58½
Yellow brass	59½	54½
Red brass	63	56½
Comm. bronze	64	57
Mang. bronze.....	58½	57½
Free cutting rod ends	44	43

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	50
Light copper	41

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	52
No. 2 copper wire	46
Light copper	37
No. 1 composition	52
No. 1 comp. turnings.....	47
Hvy. yellow brass solids	34
Hvy. yellow brass turnings.....	25
Radiators	41

Aluminum

New mixed clips	24	—25
Old sheet.....	23	—24
Old cast.....	23	—24
Clean dry borings	24	—25

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings.....	23	—24
Mixed L.C. clips	21	—22
Old sheets and cast	15	—16
Borings and turnings	12	—13
Duraluminum clippings	22	—23

Copper and Brass

No. 1 copper wire.....	44	—45
No. 2 copper wire	37	—38
Light copper.....	32	—33
Radiators.....	32	—33
No. 1 composition	41	—42
No. 1 composition turn'gs.....	39	—40
Cocks and faucets.....	28	—29
Clean heavy yellow brass	24	—25
Brass Pipe	28	—29
New soft brass clippings.....	36	—37

Lead

Heavy soft lead.....	10	—11
Whole batteries.....	5	—6
Type metal	15	—16
Electrotype	20	—21

Nickel

Nickel solids.....	115	—120
Nickel rod ends.....	115	—120
Nickel sheets, clips.....	115	—120
Nickel turnings.....	55	—60

Zinc

New zinc clippings.....	14	—15
Old diecast zinc	7	—8

EFFECTIVE NOVEMBER 1, 1982

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MATERIALS NEWSFRONT

(Effective November 1, 1982) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of Iron Age editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	\$ 52.00 to \$ 53.00
No. 2 hvy. melting	45.00 to 46.00
No. 1 dealer bundles	63.00 to 64.00
No. 1 factory bundles (auto)	60.00 to 61.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	61.00 to 62.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. punchings plate	67.00 to 68.00
Heavy turnings	45.00 to 46.00
No. 1 RR hvy. melting	65.00 to 66.00
Rails 2 ft. and under	90.00 to 91.00
Scrap rails, random lgth.	78.00 to 79.00
RR specialties	71.00 to 72.00
No. 1 machinery cast	64.00 to 65.00
Cupola cast	57.00 to 58.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	490.00 to 500.00
18-8 turnings	390.00 to 400.00

Chicago

No. 1 hvy. melting	\$ 46.00 to \$ 47.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 dealer bundles	56.00 to 57.00
No. 1 factory bundles (auto)	59.00 to 60.00
No. 2 dealer bundles	38.00 to 39.00
No. 1 busheling	57.00 to 58.00
Shredder scrap	56.00 to 57.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	33.00 to 34.00
Low phos. forge crop	77.00 to 78.00
Low phos. punchings plate	
1/4 in. and heavier	81.00 to 82.00
Low phos. 2 ft. and under	76.00 to 77.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	51.00 to 52.00
Roller rails	85.00 to 86.00
Rails, 2 ft. and under	77.00 to 78.00
RR couplers and knuckles	70.00 to 71.00
RR car axles	102.00 to 103.00
No. 1 machinery cast	103.00 to 104.00
Cupola cast	89.00 to 90.00
Stove plate	76.00 to 77.00
Steel car wheels	61.00 to 62.00
Stainless	
18-8 bundles and solids	450.00 to 460.00
18-8 turnings	350.00 to 360.00
430 bundles and solids	95.00 to 100.00
430 turnings	65.00 to 70.00

Philadelphia

No. 1 hvy. melting	\$ 54.00 to \$ 57.00
No. 2 hvy. melting	48.00 to 51.00
No. 1 dealer bundles	65.00 to 68.00
No. 2 dealer bundles	38.00 to 41.00
No. 1 busheling	65.00 to 68.00
Shredder scrap	71.00 to 74.00
Machine shop turn.	18.00 to 21.00
Mixed bor. and turn.	18.00 to 21.00
Shoveling turnings	30.00 to 33.00
Clean cast chemical borings	40.00 to 43.00
Low phos. 5 ft. and under	60.00 to 63.00
Low phos. 2 ft. punchings	85.00 to 88.00
Electric furnace bundles	75.00 to 78.00
RR specialties	74.00 to 77.00
Rails, 2 ft. and under	89.00 to 92.00
Cupola cast	53.00 to 56.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:	
No. 1 hvy. melting	\$ 36.00 to \$ 37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	40.00 to 41.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed borings and turn.	7.00 to 8.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	5.00 to 6.00
Heavy breakable cast	24.00 to 25.00
Mixed cupola cast	40.00 to 41.00
Automobile cast	58.00 to 59.00
Stainless	
18-8 bundles and solids	395.00 to 405.00
18-8 turnings	285.00 to 295.00
430 bundles and solids	70.00 to 80.00

Youngstown

No. 1 hvy. melting	\$ 45.00 to \$ 46.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	51.00 to 52.00
No. 2 dealer bundles	30.00 to 31.00
Machine shop turn.	2.00 to 3.00
Shoveling turnings	8.00 to 9.00
Low phos. plate	52.00 to 53.00
Electric furnace bundles	52.00 to 53.00
Galvanized bundles	42.00 to 43.00

Cleveland

No. 1 hvy. melting	\$ 42.00 to \$ 43.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	51.00 to 52.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	53.00 to 54.00
Machine shop turn.	2.00 to 3.00
Mixed bor. and turn.	2.00 to 3.00
Shoveling turnings	5.00 to 6.00
Cast iron borings	5.00 to 6.00
Cut structural & plates, 2 ft. and under	72.00 to 73.00
Low phos. punchings plate	72.00 to 73.00
Drop forge flashings	33.00 to 34.00
Foundry steel, 2 ft. & under	62.00 to 63.00
No. 1 RR hvy. melting	63.00 to 64.00
Rails, 2 ft. and under	82.00 to 83.00
Rails, 18 in. and under	83.00 to 84.00
Steel axle turnings	69.00 to 70.00
Railroad cast	87.00 to 88.00
No. 1 machinery cast	87.00 to 88.00
Cupola cast	87.00 to 88.00
Stove plate	60.00 to 61.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	295.00 to 305.00
430 bundles	75.00 to 85.00

Buffalo

No. 1 hvy. melting	\$ 25.00 to \$ 26.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 busheling	32.00 to 33.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	12.00 to 13.00
Machine shop turn.	1.00 to 2.00
Mixed bor. and turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	8.00 to 9.00
Low phos. plate	52.00 to 53.00
Structural and plate, 2 ft. and under	50.00 to 51.00
Rails, 2 ft. and under	42.00 to 43.00
Scrap rails, random lgth.	22.00 to 23.00
No. 1 machinery cast	65.00 to 66.00
No. 1 cupola cast	44.00 to 45.00

St. Louis

No. 1 hvy. melting	\$ 50.00 to \$ 51.00
No. 2 hvy. melting	42.00 to 43.00
Foundry steel, 2 ft.	42.00 to 43.00
No. 1 dealer bundles	50.00 to 51.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	30.00 to 31.00
No. 1 RR hvy. melting	50.00 to 51.00
Rails, random length	52.00 to 53.00
Rails, 18 in. and under	67.00 to 68.00
RR specialties	80.00 to 81.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	70.00 to 71.00
Cast iron car wheels	49.00 to 50.00
Rolling rails	84.00 to 85.00
Unstripped motor blocks	55.00 to 56.00

Birmingham

No. 1 heavy melting	\$ 56.00 to \$ 57.00
No. 2 heavy melting	53.00 to 54.00
No. 1 dealer bundles	56.00 to 57.00
No. 2 bundles	43.00 to 44.00
No. 1 busheling	54.00 to 55.00
Shredder scrap	72.00 to 73.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	52.00 to 53.00
Elec. furnace, 3 ft. & under	52.00 to 53.00
Structural and plate, 2 ft.	70.00 to 71.00
Structural and plate, 4 ft.	67.00 to 68.00
No. 1 RR hvy. melting	54.00 to 55.00
Scrap rails, random lgth.	59.00 to 60.00
Rails, 18 in. and under	74.00 to 75.00
Angles and splice bars	65.00 to 66.00
No. 1 cupola cast	75.00 to 77.00
Unstripped motor blocks	55.00 to 56.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$ 29.00 to \$ 30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	3.00 to 4.00
Cast iron borings	4.00 to 5.00
Low phos. 18 in. and under	56.00 to 57.00
Rails, random length	36.00 to 37.00
Rails, 2 ft. and under	63.00 to 64.00
No. 1 cupola cast	44.00 to 45.00
Heavy breakable cast	20.00 to 21.00
Drop broken cast	59.00 to 60.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$ 28.00 to \$ 29.00
No. 2 hvy. melting	24.00 to 26.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	16.00 to 18.00
Mixed bor. and turn.	4.00 to 5.00
Machine shop turn.	4.00 to 5.00
Shoveling turnings	10.00 to 12.00
Clean cast chem. borings	34.00 to 35.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	38.00 to 39.00
Heavy breakable cast	14.00 to 15.00
Stainless	
18-8 prepared solids	440.00 to 450.00
18-8 turnings	375.00 to 400.00
430 prepared solids	90.00 to 100.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$ 28.00 to \$ 30.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	16.00 to 18.00
No. 1 busheling	28.00 to 30.00
Shredder scrap	38.00 to 40.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	2.00 to 4.00
No. 1 machinery cast	100.00 to 105.00
Mixed cupola cast	23.00 to 25.00
Heavy breakable cast	4.00 to 6.00

San Francisco

No. 1 hvy. melting	\$ 40.00 to \$ 42.00
No. 2 hvy. melting	32.00 to 34.00
No. 1 dealer bundles	27.00 to 29.00
No. 2 dealer bundles	12.00 to 14.00
Machine shop turn.	4.00 to 6.00
Cast iron borings	4.00 to 6.00
No. 1 cupola cast	84.00 to 86.00

Los Angeles

No. 1 hvy. melting	\$ 39.00 to \$ 41.00
No. 2 hvy. melting	28.00 to 30.00
No. 1 dealer bundles	26.00 to 28.00
No. 2 dealer bundles	9.00 to 11.00
Machine shop turn.	4.00 to 6.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	4.00 to 6.00
Elec. furnace, 1 ft. and under (foundry)	85.00 to 87.00
No. 1 cupola cast	87.00 to 89.00

Seattle

No. 1 hvy. melting	\$ 54.00 to \$ 56.00
No. 2 hvy. melting	43.00 to 45.00
No. 2 bundles	33.00 to 35.00
No. 1 cupola cast	89.00 to 91.00
Mixed yard cast	79.00 to 81.00

Hamilton, Ont.

Brokers buying price per net ton on cars:	
No. 1 heavy melting	\$ 33.00
No. 2 heavy melting cut 2 ft. and under	30.00
No. 1 dealer bundles	40.00
No. 2 bundles	5.00
Mixed steel scrap	17.00
Bush. new fact. prep'd	38.00
Bush. new fact. unprep'd	30.00
Machine shop turn.	18.00
Short steel turn.	21.00
Mixed bor. and turn.	10.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$ 55.00 to \$ 56.00
No. 2 hvy. melting	43.00 to 44.00
No. 2 bundles	28.00 to 30.00
Machine shop turn.	8.00 to 9.00
Crushed turnings	22.00 to 24.00
Shredder scrap	55.00 to 56.00
Cut structural plate 2 ft. and under	77.00 to 78.00
Unstripped motor blocks	55.00 to 57.00
Cupola cast	64.00 to 66.00